REMARKS

Claims 1 through 19 are pending in this application.

I. 37 C.F.R. §1.104

Further clarification of the rejections by the Examiner would be very helpful to the Applicant. Respectfully, the Examiner must provide the completeness in the rejection under 37 C.F.R. §1.104(b) and (c) in formulating the rejection. As mentioned in 37CFR §1.104 (c)(2), "When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable." The particular parts relied upon were not mentioned and therefore it makes it difficult for the Applicant to respond to the Examiner's rejection. The Applicant would greatly appreciate the Examiner's help in this matter.

As seen in paper number 7, the Examiner has failed to provide the designation of the particular parts being relied upon. For example, in the 35USC§102 rejection of claim 1, only a verbatim copy of claim 1 is mentioned without mentioning any further elaboration as what is being relied on in Saito.

The same is true for the 35USC§102 rejections of claims 6, 16 and the 35USC§103 rejections of claims 4, 5, 7, 10, 11, 12, 14, 15, 17, 18 and 19. Only with the 35USC§102 rejections of claims 2 and the 35USC§103 rejections of claims 3, 8, 9 and 13 is there any attempt at mentioning the particular part relied on.

Therefore, under 37CFR §1.104 (c)(2), the Applicant would appreciate the Examiner provide a more complete office action by providing the designation of the particular part relied on as nearly

as practicable for the 35USC§102 rejections of claims 1, 6, 16 and the 35USC§103 rejections of claims 4, 5, 7, 10, 11, 12, 14, 15, 17, 18 and 19. Currently, the office action provided by the Examiner, paper number 7, is incomplete. This incomplete office action, therefore, is jeopardizing the Applicant's right to due process.

The burden is on the Examiner to prove a *prima facie* case for rejection of the claims and not on the Applicant to figure out what the Examiner is referring to.

II. CLAIM REJECTIONS - 35 U.S.C. § 102

Claims 1, 2, 6 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US 5118984).

No claim is anticipated under 35 U.S.C. §102 (b) unless all of the elements are found in exactly the same situation and united in the same way in a single prior art reference. As mentioned in the **MPEP §2131**, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Every element must be literally present, arranged as in the claim. *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 9 USPQ2d 1913, 1920 (CAFC 1989). The identical invention must be shown in as complete detail as is contained in the patent claim. *Id.*, "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson,* 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970), and MPEP 2143.03.

Concerning claims 1, 2, 6 and 16, Saito discloses none of the below mentioned elements of the claims because Saito concerns an *oxide cathode* which has an electron emissive material layer and a separate metal layer. The present invention on the other hand claims a *metal cathode*. In paragraphs 3 through 5 of the present application, some of the differences between the two types of cathodes are explained.

Specifically regarding claim 1, the Examiner states that Saito discloses a metal cathode for an electron-beam device, the metal cathode comprising an electron-emitter including a first alloy, the first alloy comprising barium being in the range of 0.1 to 20%, a metallic mobilizer in the range of 0.1 to 20% selected from the group consisting of Mo, Hf, Zr and Th, a metal with a difference in atomic radius of at least 0.4 A from the atomic radius of any one of Pt and Pd, in the range of 0.01 to 30% and at least one element selected from the group consisting essentially of Pt.

The *first alloy* of the *electron-emitter* of a metal cathode is not disclosed in Saito as Saito is only disclosing the metal layer and emissive material layers of an oxide cathode. As shown below, the elements of the *first alloy* of the *electron-emitter* of the present invention are not disclosed by Saito.

Looking through the entire disclosure of Saito, no range of 0.1 to 20% or any range at all is disclosed for Barium being of the first alloy of the electron-emitter. The disclosure of Saito mentions 0.01 to 25 wt % of a rare earth metal oxide, where alkali earth metal oxide includes at least barium

oxide. However, .01 to 25 % is of barium oxide and not barium. Furthermore, the barium oxide is from the emissive material layer of an oxide cathode.

Furthermore even though the range of barium is not disclosed, the range .01 to 25% is not the same as .01 to 20% . When the ranges are not the same and there is an overlap, one must look to MPEP §2131.03 under the section for overlapping ranges. MPEP §2131.03 states that "When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation." Therefore, since there is a disclosure of an overlapping range, but since Saito does not disclose a "specific" example falling within the range, a case by case basis must be made. Specific example in MPEP §2131 means for example "point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni and this composition was within the claimed range of compositions)." Clearly no "specific example as explained in the MPEP above is shown in Saito's range of .01 to 25%.

Furthermore, Saito does not disclose a *metallic mobilizer in the range of 0.1 to 20% selected from the group consisting of Mo, Hf, Zr and Th.*

For example, molybdenum is shown to be in the metal layer of Saito and not in the electron-emitter. Hafnium is not even disclosed. Zirconium is not mentioned for the electron-emitter. Thorium is also not mentioned in the entire disclosure of Saito. Furthermore, no range is even disclosed for any of the above metallic mobilizers.

Furthermore, there is clearly no such disclosure as a metal with a difference in atomic radius of at least 0.4 A from the atomic radius of any one of Pt and Pd, in the range of 0.01 to 30%. As mentioned in MPEP §2131, the identical invention must be shown in as complete detail as is

contained in the patent claim. *Id.*, "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson,* 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970), and MPEP 2143.03. Nothing is mentioned concerning a metal with difference in atomic radius of .04 Angstroms from any one of atomic radius of Pt and Pd.

Saito also does not disclose the first alloy of an electron-emitter having at least one element selected from the group consisting essentially of Pt and Pd. The only disclosure of Pt is for the metal layer which is clearly not the electron-emitter.

Regarding claim 2, the Examiner states that Saito discloses the metal is at least one member selected from the group consisting essentially of Ca, Sr and Ce (column 3, lines 50-68).

In col. 3, lines 50-68, strontium oxide is mentioned, however, strontium oxide is a part of the emissive material layer of an oxide cathode and not the electron-emitter of a metal cathode.

Regarding claim 6, the Examiner explains that Saito discloses the cathode assembly being indirectly heated. Here, although indirect heating is mentioned in Saito for the electron tube cathode, still Saito does not disclose indirectly heating the cathode assembly comprising the metal cathode of claim 1 but of indirectly heating an oxide-cathode.

Regarding claim 16, the Examiner explains that Saito discloses a metal cathode for an electron-beam device, the metal cathode comprising an electron-emitter including a first alloy, the

first alloy comprising barium being in the range of 0.1 to 20%, a metallic mobilizer in the range of 0.1 to 20% selected from the group consisting of Mo, Hf, Zr and Th, a metal with a difference in atomic radius of at least 0.4 A from the atomic radius of any one of Pt and Pd, in the range of 0.01 to 30% and at least one element selected from the group consisting essentially of Pt.

The *electron-emitter* of a metal electrode is not disclosed in Saito as Saito is only disclosing the metal layer and emissive material layers of an oxide electrode. As shown below, the elements of the *electron-emitter* of a metal cathode of the present invention are not disclosed by Saito.

In the entire disclosure of Saito, no range of 0.1 to 20% by weight based on the total weight of the electron-emitter or any range at all is disclosed for Barium being of the electron-emitter. As mentioned in the remarks of claim 1, the disclosure of Saito mentions 0.01 to 25 wt % of a rare earth metal oxide, where alkali earth metal oxide includes at least barium oxide. However, .01 to 25 % is of barium oxide and not barium. Furthermore, the barium oxide is from the emissive material layer of an oxide cathode and not for an electron-emitter of a metal cathode.

Further, even though the range of barium is not disclosed, the range .01 to 25% is not the same as .01 to 20% . As mentioned above, when the ranges are not the same and there is an overlap, one must look to MPEP §2131.03 under the section for overlapping ranges. Therefore, since there is a disclosure of an overlapping range, but since Saito does not disclose a "specific" example falling within the range, a case by case basis must be made. Clearly no "specific example as explained in the MPEP above is shown in Saito's range of .01 to 25%.

In addition, Saito does not disclose a *metallic mobilizer in the range of 0.1 to 20% by weight*

based on the total weight of the electron-emitter... selected from the group consisting of Mo, Hf, Zr and Th.

As mentioned in the remarks of claim 1, for example concerning claim 16, molybdenum is shown to be in the metal layer of Saito and not in the electron-emitter. Hafnium is not even disclosed. Zirconium is not mentioned for the electron-emitter. Thorium is also not mentioned in the entire disclosure of Saito. Furthermore, no range is even disclosed for any of the above metallic mobilizers.

Furthermore, as mentioned above, there is clearly no such disclosure as a metal with a difference in atomic radius of at least 0.4 A from the atomic radius of any one of Pt and Pd, in the range of 0.01 to 30% by weight based on the total weight of the electron-emitter. Nothing is mentioned concerning a metal with difference in atomic radius of .04 Angstroms from any one of atomic radius of Pt and Pd.

Saito also does not disclose the electron-emitter having a balance of at least one of Pt and Pd as mentioned claim 16. The only disclosure of Pt is for the metal layer which is clearly not the electron-emitter.

III. REJECTION OF CLAIMS (35 U.S.C. § 103)

Claims 3-5, 7-15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 5118984) in view of Frank et al. (US 4533852).

According to MPEP 706.02(j), the following establishes a *prima facie* case of obviousness under 35 U.S.C. §103:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Examiner has failed to show that the combination of references teaches or suggests all of the claim limitations.

The Examiner states that Saito discloses all of the above claim limitations but fails to clearly point out the metal being an alloy of Ce, Os, Ir and Ru and includes Ru in the range of 1 to 10%.

Regarding claims 3 and 9, the Examiner states that Frank discloses (column 2) the metal being an alloy of Ce and Ir in order to achieve a long life, high emitter concentration and high mechanical stability.

Looking at col. 2 of Frank, the Applicant noticed that only Ir is mentioned. However, this concerns a polycrystalline layer of a thermionic cathode and not the metal of the electron-emitter of a metal cathode.

Regarding claims 4 and 10, the Examiner explains that Frank discloses the metal being an alloy of Ce and Ir in order to achieve a long life, high emitter concentration and high mechanical stability. However, claim 4 specifically states that the alloy of Ce and Ir is Ir_5Ce and Ir_5Ce is not taught or suggested by Frank.

Regarding claims 5, 14,15,18, 19 the Examiner explains that Saito discloses the cathode assembly being indirectly heated. However, Saito is teaching a non-analogous art in that Saito concerns an oxide cathode and the present invention concerns a metal cathode. Therefore, Saito and Frank should not be combined. Saito teaches about indirectly heating an oxide cathode assembly and not a metal cathode assembly.

Therefore, also concerning claims 3-5, 7-15 and 17-19, Frank should not be combined with the non-analogous oxide cathode of Saito.

Regarding claim 7, the Examiner states that Frank discloses the metal being an alloy of Ce,

Os and Ir in order to achieve a long life, high emitter concentration and high mechanical stability.

Looking through Frank, Os and Ir are mentioned in Frank in col. 2, but as mentioned above, the Os and Ir in col. 2 is part of the polycrystalline layer of a thermionic cathode and not the metal of the electron-emitter of a metal cathode.

Looking further in Frank, Os and Ir is also mentioned being in an oxide form of an electron-emissive material of a thermionic cathode (not cited by the Examiner). Again, Frank does not teach or suggest the limitation of claim 7.

Regarding claim 8, the Examiner states that Saito discloses the metal is at least one member selected from the group consisting essentially of Ca, Sr and Ce (column 3, lines 50-68). Looking at col. 3, lines 50-68, strontium oxide is mentioned and not strontium which is not essentially the same. Again as mentioned before, Saito teaches of the strontium oxide being a part of the emissive layer in an oxide cathode and not the electron-emitter of a metal cathode.

Regarding claim 11, the Examiner states that Saito discloses the layer coated on the electron-emitter has a thickness in the range of 500 to 30,000 A.

In Saito, no thickness of the electron-emitter layer is taught or suggested. Only the thickness of the metal layer of the oxide cathode is mentioned and even that thickness is not within the range of 500 to 30,000 angstroms.

Regarding claim 12, the Examiner states that Saito discloses the layer coated on the electron-

emitter has a thickness in the range of 1000 to 10,000 A.

In Saito, no thickness of the electron-emitter layer is taught or suggested. Only the thickness of the metal layer of the oxide cathode is mentioned and even that thickness is not within the range of 1000 to 10,000 angstroms.

Regarding claim 13, the Examiner states that Frank discloses (claim 23) the alloy of Os and Ru includes Ru in the range of 1 to 10% in order to achieve a long life, high emitter concentration and high mechanical stability.

In Frank, Os is mentioned in claim 23 of Frank, but Ru is not mentioned at all and claim 13 of the present invention specifically states the alloy of Os and Ru. Further, the Os in Frank is not a part of the electron-emitter of a metal cathode and the range is not given according to total weight of Os and Ru together but the weight overall.

Regarding claim 17, the Examiner states that Frank discloses the metal being an alloy of Ce, Os and Ir in order to achieve a long life, high emitter concentration and high mechanical stability.

However, as mentioned specifically in claim 17, it states that *further comprising a layer coated on the electron-emitter, the layer being at least one member consisting essentially of iridium (Ir) and an alloy of osmium (Os) and ruthenium (Ru).* The present invention is stating Ir and an alloy of Os and Ru and not an alloy of Ce, Os, and Ir as the Examiner states. Frank does not teach or suggest a layer coated on the electron-emitter of a metal cathode and Frank does not teach or suggest the layer having Ir or the alloy of Os and Ru. It is not even clear which portion of Frank the

Examiner is referring to. If it is col. 2 as mentioned earlier, Ir is taught and this is a layer deposited on a conventional cathode but does not teach or suggest that it coats the electron emitter. Even when combined with Saito, it does not teach or suggest coating on an electron emitter of a metal cathode as Saito concerns an oxide cathode.

According to the first criteria of MPEP 706.02(j), the Examiner has failed in his burden of showing a proper suggestion or motivation to modify or combine the references.

According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the cathode of Saito with the metal being an alloy of Ce, Os and Ir in order to achieve a long life, high emitter concentration and high mechanical stability, as taught by Frank.

The first point in MPEP 706.02(j) states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability. *In re Dembiczak*, 175 F.3d 994, 50 USPQ.2d 1614 (Fed. Cir. 1999). The showing must be "clear and particular" without broad generalized conclusory statements. *Id.* There must be specific statements showing the scope of the

suggestion, teaching, or motivation to combine the prior art references. *Id.* at 1000. There must be an explanation to what specific understanding or technical principle would have suggested the combination of references. *Id.* The mere fact that the teachings of the prior art can be combined or modified does not itself make the resultant *prima facie* obvious. MPEP 2143.01.

Therefore, respectfully, here the Examiner's suggestion of the motivation being obvious to one of ordinary skill in the art at the time the invention was made to use the cathode of Saito with the metal being an alloy of Ce, Os and Ir in order to achieve a long life, high emitter concentration and high mechanical stability, as taught by Frank is, respectfully, improperly not "clear and particular" but a broad generalized conclusory statement. To simply state that the combination is made because of achieving a long life, high emitter concentration and high mechanical stability is very broad and a conclusory statement.

Furthermore, according to MPEP 706.02(j), "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." Therefore, the applicant's disclosure cannot be used to show the motivation to combine or modify the references.

In view of the foregoing amendments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. If there are any questions, the examiner is asked to contact the applicant's attorney.

No fee is incurred by this Response. Should there be a deficiency in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

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